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ABSTRACT

The purpose of this study was to investigate the effect of being imitated on behaviors of preschool children. Each of 24 subjects was given a choice of three responses in a marble-dropping task and was required to make one choice, after which an experimenter either imitated or did not imitate a subject's behavior. The results indicated that when a response is imitated by an experimenter, the response frequency is maintained; however, when a response that was previously imitated was no longer imitated, the response frequency significantly decreased. These results were interpreted as providing evidence that behavioral similarly produced by an experimenter has positive reinforcing properties. (Author)

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IMITATION IN CHILDREN:

THE EFFECT OF BEING IMITATED

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Paper presented to the Western Psychological Association, Portland, Oregon, April, 1972.

"IMITATION IN CHILDREN: THE EFFECT OF BEING IMITATED"

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The imitation paradigm typically involves a subject observing and subsequently imitating the behavior of a model. Imitative behavior results in behavioral similarity between the model and observer. Another situation in which behavioral similarity occurs is one in which a person is imitated by another: for example, parents are imitated by their children, a person agrees with another. The result of being agreed with, identified with, or being imitated is often positive affect. This affective state may indicate that being imitated results in positive reinforcement to the person being imitated. It is surprising that this situation has received no research attention, since there may be many instances in which people and children are influenced by being imitated. The purpose of this study was to investigate the effect of being imitated on behavior.

In order to determine the effect of being imitated, the following situation was employed. A subject was given a choice of three responses and was asked to make one, after which the experimenter either imitated or did not imitate the subject's behavior. The focus of interest was whether a subject would repeat

the response which was imitated or choose a response different from that which was imitated. Baer and Sherman (1964) suggest that behavioral similarity has positive reinforcing properties and maintains imitative behaviors. Parten and Fouts (1969) suggest that similarity *per se* has a reinforcing function and that behavioral similarity produced by imitation is a subclass of situations in which similarity may occur and influence behavior. Accordingly, it was predicted that behaviors of a subject followed by similarity produced by an experimenter would continue to occur or increase in frequency. On the other hand, when behaviors which were previously followed by similarity were no longer followed by similarity, it was predicted that the behaviors would decrease in frequency, since the removal of similarity would constitute an extinction procedure.

Method

Subjects

Twenty-four children (10 boys and 14 girls; CA. 4.2 years) were randomly selected from a cooperative nursery school. The children came from middle-class white families. Subjects (Ss) were randomly assigned to six experimental conditions which counterbalanced the particular responses and the order of

responses which would be imitated by an experimenter (E). There were four Ss per condition.

Procedure

A female adult E with whom Ss were familiar escorted each S to an experimental room, explaining that they were going to play a marble game. The game apparatus consisted of a small gray box with three holes in the top surface; the holes formed an isosceles triangle. Identical instructions were given all Ss. Each S was told (a) to drop a marble in any of the three holes that he wished, (b) that E would then drop a marble in any hole that the E wished, and (c) that this alternation of responding was to be repeated several times. At a signal from E, S picked up a marble and dropped it into one of the holes; E then either dropped a marble into the same or different hole. At the completion of both responses (trial) E recorded the responses and signaled the beginning of the next trial.

In the first half of the experiment (30 trials), a hole was designated as that which would result in imitation if an S were to drop a marble in that hole (Imitation condition). In the second half (30 trials), an S was imitated at another hole, with responding at the originally designated hole now resulting in nonimitation by E (Nonimitation condition). In order

to eliminate the possible effects of position preference, six experimental groups were constituted: 1-2, 2-3, 1-3, 2-1, 3-2, and 3-1. The numbers represent the holes at which E imitated S in the first and second halves, respectively. The duration of each half was approximately five minutes.

In this situation, it was possible that an S may imitate the E who just previously imitated him (reciprocal imitation), with the E serving modeling (cueing) function rather than the agent of reinforcement (behavioral similarity). Thus, any subsequent increase in responding at the hole at which an S was being imitated could be the result of similarity serving a reinforcing function and/or E serving a cueing function. In order to decrease the likelihood of the cueing function of E, an additional restraint was placed on E's behavior. When not imitating S, E would never place the marble in the hole designated for imitation; thus responding at the hole designated as that to be imitated was always initiated by S, not E. For example, under Condition 1-2, the first half, if S responded to hole #1, E would drop a marble in #1; if S responded to #2, E would respond to #3; if S responded to #3, E would respond to #2.

Results

The responding of E was examined first in order to determine whether her behavior differed at the designated hole (the

hole initially producing imitation, then nonimitation) under the Ss' Imitation and Nonimitation conditions. This analysis was necessary in order to interpret the Ss' data because if there were a difference in E's behavior between the Imitation and Nonimitation conditions (e.g., more responses at the designated hole during the Imitation than Nonimitation condition), the difference between these conditions for Ss could then be argued to be due to the modeling effect of E, rather than the similarity produced by E. An analysis of variance was performed on the frequency of marble-dropping; the two within-subject factors were Consequence (Imitation and Nonimitation) and Trial Blocks (2 trial blocks of 15 responses per trial block). There were no significant effects ($p > .10$) for Consequence, Trial Blocks, or Consequence X Trial Blocks. There were also no significant differences among any of the pair-wise comparisons of Trial Blocks across the Imitation and Nonimitation conditions (Tukey in Hayes, 1963). The absence of any significant differences in responding of E (see Table) for the mean performances of E and Ss) indicates that since responding at the designated hole was similar throughout the experimental session, i.e., the modeling was similar, any differences which may appear in Ss' behavior cannot be attributed to the modeling of E.

Insert Table 1 about here

It was predicted that (a) responding followed by imitation would either be maintained or increase in frequency, and (b) responding which was previously imitated and subsequently nonimitated would decrease in frequency. An analysis of variance on the frequency of Ss' marble-dropping was performed with the two within-subject factors being Consequence and Trial Blocks. There were no significant effects ($p > .05$) of Consequence or Consequence X Trial Blocks. There was a significant effect ($p < .025$) of Trial Blocks, (F (1/23) = 5.87. Pair-wise comparisons across Trial Blocks (Tukey in Hayes, 1963) revealed the following significant ($p < .05$) differences: less responding in Trial Block 1 of the Nonimitation condition than either Trial Blocks 1 or 2 in the Imitation condition and more responding in Trial Block 2 than Trial Block 1 in the Nonimitation condition. The first prediction received support insofar as the response frequency (see Table 1) increased from Trial Block 1 to Trial Block 2, although the increase was nonsignificant. The second prediction was supported by the significant decrease between Trial Blocks 1 and 2 in the Imitation condition and Trial Block 1 in the Nonimitation condition. The increase in responding from Trial Block 1 to 2 in the Nonimitation condition was not expected.

Discussion

The purpose of this study was to investigate the effect of

being imitated on preschool children's behavior. It was assumed that the similarity produced by E imitating an S would serve as a positive reinforcing event, the delivery of which would maintain or increase responding and the removal of which would decrease responding. An examination of Table 1 and the statistical analysis show a nonsignificant increase in responding when imitated by E. These results are consistent with the first prediction. It was predicted that there would be a decrease in responding when similarity was no longer contingent on Ss' behaviors. An examination of change in responding of Ss from the two trial blocks under the Imitation condition to the first trial block under the Nonimitation condition and the statistical analysis reveal a significant decrease in responding. This finding is consistent with the prediction and provides evidence that the removal of similarity produced by being imitated may serve either as an extinction or punishment procedure. The latter would seem more plausible since the decrease was quite sharp as opposed to a gradual decline normally found under extinction procedures. Informal observation during the experiment supports the punishing aspect of removal of similarity. In general, the first trials immediately following the removal of similarity contingent on the designated hole produced emotional behaviors in the Ss, e.g.,

frowning, asking E what S did wrong, "puzzlement." This reaction to the removal of similarity contingent on responding was similar to that found in a previous study (Parton & Fouts, 1969), in which a button-pushing response was followed by either similarity or dissimilarity.[2]

The unexpected finding of an increase in responding during the Nonimitation condition may be explained by any one or combination of the following hypotheses. First, informal observation suggested there was an increase in boredom which increased the variability in responding, resulting in behavior at the designated hole. Second, similarity as a conditioned reinforcer may be relatively weak and may have begun to lose its reinforcing properties in the absence of occasional association with other reinforcers.[3] Third, there may have been the satiation of similarity as a reinforcer, through being imitated at the other hole in the second half of the experiment. This would have resulted in decreased responding at the imitated hole, thereby increasing responding at the nonimitated holes.

These findings appear to support the assumption that behavioral similarity is a positive reinforcer in a situation in which behaviors of children are imitated. Thus the effect of being imitated is to maintain that behavior, and the effect of no longer

being imitated is to reduce responding. It is unlikely that these findings can be attributed to Ss' imitation of E because E modeled similarly throughout the experiment; and in the absence of differences in modeling, the differences in Ss behavior would appear to be due to reinforcing stimuli rather than modeling stimuli. It is possible, however, that in some segment of the experiment Ss' behavior was due to modeling and this effect was not evident because similarity reinforcement was also occurring. It may be the case that it is experimentally impossible to completely separate the effects of modeling (a cueing function) and similarity (a reinforcing functioning) since they usually occur simultaneously. Nevertheless, research is presently under way which attempts to better separate the two processes by using various schedules of similarity as a reinforcer and by performing a sequential analysis of experimenter and subject behaviors.

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Footnotes

1. This study was supported by a Faculty Research Grant provided by the Graduate School, University of Denver, Denver, Colorado. The author wishes to express his appreciation to Dr. Larry Fenson for his help in the preparation of this manuscript.

2. The emotional behaviors occurring in the Partor and Fouts study were not reported in the article, although they were informally observed by the second author.

3. It could be argued that during the Imitation condition, there were two types of similarity--that which resulted when E imitated an S and that which resulted from an S imitating E. It is possible that the latter was maintained by the former; and when E no longer imitated S, the reinforcing properties in S-produced similarity rapidly extinguished, as would be expected of a higher order conditioned reinforcer.

Table 1

Mean Performances of E and Ss under the Imitation and Nonimitation Conditions

	Imitation		Nonimitation	
Trial Blocks	1	2	1	2
E	6.08*	6.21	5.52	5.33
Ss	6.08	6.21	4.25	5.79

*Responding at chance level is 5.00 responses per Trial Block.